

Strabismus



AMERICAN ACADEMY
OF OPHTHALMOLOGY

What is strabismus?

Strabismus is a visual defect in which the eyes are misaligned and point in different directions. One eye may look straight ahead, while the other eye turns inward, outward, upward or downward.

You may always notice the misalignment, or it may come and go. The turned eye may straighten at times and the straight eye may turn.

Strabismus is a common condition among children. About 4% of all children in the United States have strabismus. It can also occur later in life.

It occurs equally in males and females. Strabismus may run in families. However, many people with strabismus have no relatives with the problem.

How do the eyes work together?

With normal vision, both eyes aim at the same spot. The brain then fuses the two pictures into a single three-dimensional image. This three-dimensional image gives us depth perception.

When one eye turns, two different pictures are sent to the brain. In a young child, the brain learns to ignore the image of the misaligned eye and sees only the image from the straight or better-seeing eye. The child then loses depth perception.

Adults who develop strabismus often have double vision because the brain is already trained to receive images from both eyes and cannot ignore the image from the turned eye.

Amblyopia

Good vision develops during childhood when both eyes have normal alignment. Strabismus may cause reduced vision, or **amblyopia**, in the weaker eye.

The brain will recognize the image of the better-seeing eye and ignore the image of the weaker or amblyopic eye. This occurs in approximately half the children who have strabismus.

Amblyopia can be treated by patching the “good” eye to strengthen and im-



Patching the eye to treat amblyopia is most successful when the child is preschool age.

prove vision in the weaker eye. If amblyopia is detected in the first few years of life, treatment is usually successful.

If treatment is delayed until later, amblyopia usually becomes permanent. As a rule, the earlier amblyopia is treated, the better the visual result.

What causes strabismus?

The exact cause of strabismus is not fully understood.

Six eye muscles, controlling eye movement, are attached to the outside of each eye. In each eye, two muscles move the eye right or left. The other four muscles move it up or down and at an angle.

To line up and focus both eyes on a single target, all of the muscles in each eye must be balanced and working together. In order for the eyes to move together, the muscles in both eyes must be coordinated.

The brain controls the eye muscles. Strabismus is especially common among children with disorders that affect the brain, such as:

- Cerebral palsy;
- Down syndrome;
- Hydrocephalus;
- Brain tumors.

A cataract or eye injury that affects vision can also cause strabismus.

What are the symptoms of strabismus?

The main symptom of strabismus is an eye that is not straight. Sometimes children will squint one eye in bright sunlight or tilt their head to use their eyes together.

How is strabismus diagnosed?

Strabismus can be diagnosed during an eye exam. It is recommended that all children have their vision checked by their pediatrician, family doctor or ophthalmologist (medical eye doctor) at or before their fourth birthday. If



All children should have their vision checked at or before their fourth birthday; earlier, if there is a family history of strabismus or amblyopia.

there is a family history of strabismus or amblyopia, an ophthalmologist can check vision even earlier than age three.

The eyes of infants often seem to be crossed. Young children often have a wide, flat nose and a fold of skin at the inner eyelid that can make the eyes appear crossed.

This appearance of strabismus may improve as the child grows. **A child will not outgrow true strabismus.**

An ophthalmologist can usually tell the difference between true and false strabismus.

How is strabismus treated?

Treatment for strabismus works to:

- Preserve vision;
- Straighten the eyes;
- Restore binocular (two-eyed) vision.

After a complete eye examination, an ophthalmologist can recommend appropriate treatment.

In some cases, eyeglasses can be prescribed for your child. Other treatments may involve surgery to correct the unbalanced eye muscles or to remove a cataract. Covering or patching the strong eye to improve amblyopia is often necessary.

Most common types of strabismus

Esotropia

Esotropia, where the eye turns inward, is the most common type of strabismus in infants.

Young children with esotropia do not use their eyes together. In most cases, early surgery can align the eyes.

During surgery for esotropia, the tension of the eye muscles in one or both eyes is adjusted. The tight inner muscles may be removed from the wall of the eye and placed further back on the eye.

This adjustment weakens their pull and allows the eyes to move outward. Sometimes the outer muscles are tightened by shortening the muscle length to allow the eyes to move outward.

Accommodative esotropia

Accommodative esotropia is a common form of esotropia that occurs in farsighted children two years or older.

When a child is young, he or she can focus the eyes to adjust for the farsightedness, but the focusing effort (accommodation) to see clearly causes the eyes to cross.

Glasses reduce the focusing effort and can straighten the eyes. Sometimes bifocals are needed for close work. Eye drops, ointment or special lenses called prisms can also be used to straighten the eyes.

Exotropia

Exotropia, or an outward turning eye, is another common type of strabismus. This occurs most often when a child is focusing on distant objects.

The exotropia may occur only from time to time, particularly when a child is daydreaming, ill or tired. Parents often notice that the child squints one eye in bright sunlight.

Although glasses, exercises or prisms may reduce or help control the outward turning eye in some children, surgery is often needed.

How is strabismus surgery done?

The eyeball is never removed from the socket during any kind of eye surgery. The ophthalmologist makes a small incision in the tissue covering the eye to reach the eye muscles.

Certain muscles are repositioned during the surgery, depending on which direction the eye is turning. It may be necessary to perform surgery on one or both eyes.

When strabismus surgery is performed on children, a general anesthetic is required. Local anesthesia is an option for adults.

Recovery time is rapid. People are usually able to resume their normal activities within a few days.

After surgery, glasses or prisms may be useful. In many cases, further surgery may be needed at a later stage to keep the eyes straight.

For children with constant strabismus, early surgery offers the best chance for the eyes to work well together. In general, it is easier for children to undergo such surgery before school age.

As with any surgery, eye muscle surgery has certain risks. These include infection, bleeding, excessive scarring and other rare complications that can lead to loss of vision.

Strabismus surgery is usually a safe and effective treatment for eye misalignment. It is not, however, a substitute for glasses or amblyopia therapy.

Injections

Botox™, a drug used in certain circumstances to treat strabismus, can be injected into an eye muscle to relax its action temporarily. The opposite muscle then tends to straighten the eye.

Although the effects of the drug wear off after several weeks, in some cases the misalignment may be permanently corrected. The injection may need to be repeated, though, and is not as effective as surgery in some cases.

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Valley Eye and Laser Center, Inc., P.S.
Dr. Paul Joos Peter Jones Tina Keogh
4011 Talbot Rd. S. # 210
Renton, WA 98055
425-255-4250 or 1-800-325-6498



AMERICAN ACADEMY
OF OPHTHALMOLOGY
P.O. Box 7424
SAN FRANCISCO, CA 94120-7424
<http://www.eyenet.org>

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